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09/559,403	04/26/2000	Yong Beom Kim	0214-0166P-SP	1204

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EXAMINER	
NGUYEN, HOAN C	
ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 10/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/559,403	KIM, YONG BEOM	
	Examiner	Art Unit	
	HOAN C. NGUYEN	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-10,23,24,26 and 28-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-10,23,24, 26 and 28-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's arguments with respect to the amended claims 1, 7, 23 and the new claims 28-30 based on the Response filed on 7/24/2006 have been considered but are moot in view of the new ground(s) of rejection. Therefore, this is Final action.

Claims 4, 11-22, 25 and 27 are cancelled. Claims 1-3, 5-10, 23-24, 26 and 28-30 are still pending.

In this rejection, examiner replaces Moriyama et al. (US4017156) with the better reference of **Faris (US6133980A)** due to applicants' argument on Moriyama et al.

Examiner uses the definition of pitch value of cholesteric liquid crystal as $p=\lambda/n$, where λ is wavelength of operating light and n is index of refraction, in col. 1 lines 40-49 of the reference: **Hoshino et al. (US006061122A)**.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the feature "the opposite side **entirely** (**means completely**) overlapping an adjacent gate line" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate

prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

On remark, applicants mentioned word "**entirely** overlapping the adjacent gate line" to be "**completely** overlapping the adjacent gate line" or "overlapping **a whole of** the adjacent gate line". These meanings will arise to the new subject matter as the following 112-rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 1-3, 5-10, 23-24, 26 and 28-30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

On 8/24/2004, claims 1, 7 and 23 amended with the feature of "the opposite side of the reflecting film **entirely** (means completely as Remark on 7/24/2006) overlapping an adjacent gate line", which does not disclose in the original disclosure.

In the original specification discloses (page 5 lines 18-25):

The arrangement of liquid crystal molecules in layer 4 is controlled by the pixel voltage. A light-transmitting region 9, through which a light can be transmitted, is formed on every pixel region of the first transparent substrate 2. This light-transmitting region 9 may be a cavity or a solid transparent material. The reflecting film 3 is formed in the entire pixel region except for the light-transmitting region 9.

Figure 4 shows the transmitting region between one gate line and one data line. Therefore, the opposite side of the reflecting film cannot **entirely** or **completely** overlapping an adjacent gate line or overlapping **a whole of** an adjacent gate line. Therefore, this amended feature "the opposite side of the reflecting film **entirely** overlapping an adjacent gate line" considers as New Subject Matter.

Claims 3-5, 6, 8-10, 24 and 28-30 are rejected sine they depend on infinite claims.

However, in last office actions, to reject these claims, examiner defined "**entirely**" as "**to the full extend**" (Merriam Websters' Collegiate Dictionary) according to the

description in the specification and Figure 4. The art rejections with the references of **Song (US6091464A)** and **Stupp et al. (US5929463A)** are repeated here.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

1. Claims 1-6, 23-24, 26, 28 and 30 are rejected under 35 U.S.C. 103(a) as being obvious over Kubo et al. (US6295109B1) in view of **Song (US6091464A)** and **Faris (US6133980A)**.

In regard to claims 1-2, 6 and 23, 24 and 26, Kubo et al. teach (Figs. 2-3 and 21-22) a transmission - reflection type liquid crystal display device comprising:

- a first transparent substrate 1;
- a second transparent substrate-2,
- a liquid crystal layer 5 between the first transparent substrate and the second transparent substrate;
- a linear polarizer 9 on the second transparent substrate;
- a circular polarizer ($\lambda/4$ wave plate 7) on an outer side of the first transparent substrate 1 according to claims 24 and 26;
- a reflecting film (reflective electrode 61 region 3R) on an inner side of the first transparent substrate adjacent to the liquid crystal layer, **the reflecting film 61 functioning as pixel electrode** and defining a light-transmitting region (transmissive electrode region 8T), wherein, as Fig. 21 shown, the light

transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflection film 61 in each pixel, an opposing side of said of reflecting film overlapping an adjacent gate line substantially.

- a λ/4 phase shift plate (λ/4 wave plate 10) between the linear polarizer 9 and the liquid crystal layer or second substrate 2; thus a circular polarizer (polarizer 9 and λ/4 wave plate 10) between the first substrate 1 and the backlight (col. 1 lines 30-35) according to claim 2.
- a transparent common electrode (transmisive electrode 4) between the linear polarizer 6 and the liquid crystal layer according to claim 6.

wherein

Claim 3:

- when a voltage is not impressed on the liquid crystal layer, the liquid crystal layer imparts or grants a phase shift of λ/4 to light transmitted through the liquid crystal layer since the retardation of liquid crystal 5 is zero when no voltage is applied (col. 10, lines 11-13).

Claim 5:

- a color filter on the reflective and transmissive electrode regions (col. 25 lines 55-58), thereby between the linear polarizer and the liquid crystal layer.

Claims 28 and 30:

- the reflection electrode 61 made of aluminum considers as the pixel electrode

However, Kobo et al. fail to disclose

- the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflecting film in each pixel, the opposite side entirely (to full extend) overlapping an adjacent gate line.
- a circular polarizer made of the cholesteric liquid crystal polarizer including a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength. Since the display device is conventionally worked or performed with the visible light, which has wavelength of λ=380nm-800nm.

Song teaches (Figs. 1-2) a liquid crystal display device with the light transmitting region disposed between an inner edge of a gate line 10 and a side of outer edge periphery of the pixel electrode 30 in each pixel, the opposite side **entirely** (to full extend) overlapping an adjacent gate line 10 for increasing the capacitance of a storage capacitor 70 in a liquid crystal display device to improve the image quality of an LCD device; thereby, it is obvious to further modify the opposite side to be **entirely** (to full extend) overlapping an adjacent gate line for maximizing the capacitance of a storage capacitor in a liquid crystal display device to improve the image quality of an LCD device. .

Faris teaches (col. 2 lines 54-64) a transmission-reflection type liquid crystal display device, wherein the circular polarizer includes a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images,

where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength λ=400nm-800nm (in range of 380-800nm) for replacing both ¼ wave plate and linear polarizer without absorbing photonic energy and producing heat (col. 3 lines 7-10) and high brightness (col. 4 lines 64-67). Besides the right handed helical cholesteric circular polarizer transmits the left-handed circular polarization component and reflects the right-handed circular polarization component.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a transmission-reflection type liquid crystal display device as Kubo et al. disclosed with (a) the opposite side of the light transmitting region to be **entirely** (to full extend) overlapping an adjacent gate line for increasing the capacitance of a storage capacitor in a liquid crystal display device to improve the image quality of an LCD device (col. 1 lines 25-26, 40-41 and 53-54); (b) the circular polarizer includes a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength λ=400nm-800nm (in range of 380-800nm) for replacing both ¼ wave plate and linear polarizer without absorbing photonic energy and producing heat (col. 3 lines 7-10) and high brightness (col. 4 lines 64-67) taught by Faris.

1. Claim 7-10 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo et al. (US6295109B1) in view of **Song (US6091464A)**.

In regard to claim 7, Kubo et al. teach (Figs. 21-22) a transmission-reflection type liquid crystal display device comprising

- a plurality of gate lines 53 and data lines 59a defining a plurality of pixels;
- a transistor in each pixel,
- a gate (gate electrode 52) of which is connected to a gate line and
- a second terminal (source electrode 59b) of which is connected to a data line;
- a reflecting film 61 **as functioning as a pixel electrode** formed in each pixel and connected to a third terminal (drain electrode 59c of the transistor in each pixel, an outer edge at a side of said reflecting film overlapping one of said gate lines substantially, while an outer edge at an opposing side of said reflecting film does not overlap an inner edge of an adjacent gate line,

wherein

- a light-transmitting region (region T) through which light may pass is disposed between one of said gate lines and said outer edge of said reflecting film, which does not overlap an inner edge of said adjacent gate line.

Claim 8:

- light-transmitting region (region T) exists between a data line adjacent to the data line connected to the second terminal of the transistor and the reflecting film in each pixel.

Claim 9:

- the reflecting film overlaps (not entirely) the data line connected to the second terminal of the transistor in each pixel as Fig. 8A shown.

Claim 10:

- the reflecting film overlaps (not entirely) a gate line adjacent to the gate line connected to the gate of the transistor in each pixel as Fig. 8A.

Claim 29:

- the reflection electrode 61 made of aluminum considers as the pixel electrode.

However, Kobo et al. fail to disclose the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflecting film in each pixel, the opposite side **entirely overlapping** an adjacent gate line.

Song teaches (Figs. 1-2) a liquid crystal display device with the light transmitting region disposed between an inner edge of a gate line 10 and a side of outer edge periphery of the pixel electrode 30 in each pixel, the opposite side **entirely** (to full extend) overlapping an adjacent gate line 10 for increasing the capacitance of a storage capacitor 70 in a liquid crystal display device to improve the image quality of an LCD device; thereby, it is obvious to further modify the opposite side to be **entirely** (to full extend) overlapping an adjacent gate line for maximizing the capacitance of a storage capacitor in a liquid crystal display device to improve the image quality of an LCD device.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a transmission-reflection type liquid crystal display device as Kubo et al. disclosed with the opposite side of the light

transmitting region to be **entirely (to full extend)** overlapping an adjacent gate line for the capacitance of a storage capacitor in a liquid crystal display device to improve the image quality of an LCD device by reducing flickering and other image defects as taught by Song (col. 1 lines 25-26, 40-41 and 53-54)

2. Claims 1-6 and 23-24, 26, 28 and 30 are rejected under 35 U.S.C. 103(a) as being obvious over Kubo et al. (US6295109B1) in view of **Stupp et al. (US5929463A)** and **Faris (US6133980A)**.

In regard to claims 1-2, 6 and 23-24 and 26, Kubo et al. teach (Figs. 2-3 and 21) a transmission - reflection type liquid crystal display device comprising:

- a first transparent substrate 1;
- a second transparent substrate-2,
- a liquid crystal layer 5 between the first transparent substrate and the second transparent substrate;
- a linear polarizer 9 on the second transparent substrate;
- a circular polarizer ($\lambda/4$ wave plate 7) on an outer side of the first transparent substrate 1 according to claims 24 and 26;
- a reflecting film (reflective electrode region 3R) on an inner side of the first transparent substrate adjacent to the liquid crystal layer, **the reflecting film 61 functioning as pixel electrode** and defining a light-transmitting region (transmissive electrode region 8T), wherein, as Fig. 21 shown, the light transmitting region disposed between an inner edge of a gate line and a side of

outer edge periphery of the reflection film 61 in each pixel, an opposing side of said of reflecting film overlapping an adjacent gate line substantially.

- a λ/4 phase shift plate (λ/4 wave plate 10) between the linear polarizer 9 and the liquid crystal layer or second substrate 2; thus a circular polarizer (polarizer 9 and λ/4 wave plate 10) between the first substrate 1 and the backlight (col. 1 lines 30-35) according to claim 2.
- a transparent common electrode (transmisive electrode 4) between the linear polarizer 6 and the liquid crystal layer according to claim 6.

wherein

Claim 3:

- when a voltage is not impressed on the liquid crystal layer, the liquid crystal layer imparts or grants a phase shift of λ/4 to light transmitted through the liquid crystal layer since the retardation of liquid crystal 5 is zero when no voltage is applied (col. 10, lines 11-13).

Claim 5:

- a color filter on the reflective and transmissive electrode regions (col. 25 lines 55-58), thereby between the linear polarizer and the liquid crystal layer.

Claims 28 and 30:

- the reflection electrode 61 made of aluminum considers as the pixel electrode

However, Kobo et al. fail to disclose

- the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflecting film in each pixel, the opposite side entirely overlapping an adjacent gate line.
- a circular polarizer made of the cholesteric liquid crystal polarizer including a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength.

Stupp et al. teaches (Fig. 1) a liquid crystal display device with the light transmitting region disposed between an inner edge of a gate line (row electrode 12) and a side of outer edge periphery of the pixel electrode 10 in each pixel, the opposite side **entirely** (to full extend) overlapping an adjacent gate line 12 for providing the extra capacitor 29 in a liquid crystal display device to improve the a charge storage capacity; thereby, it is obvious to further modify the opposite side to be **entirely** (to full extend) overlapping an adjacent gate line for maximizing the extra capacitor to improve a charge storage capacity.

Faris teaches (col. 2 lines 54-64) a transmission-reflection type liquid crystal display device, wherein the circular polarizer includes a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength λ=400nm-800nm (in range of 380-800nm) for replacing both ¼ wave plate and linear polarizer without absorbing photonic energy and producing heat (col. 3 lines

7-10) and high brightness (col. 4 lines 64-67). Besides the right handed helical cholesteric circular polarizer transmits the left-handed circular polarization component and reflects the right-handed circular polarization component.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a transmission-reflection type liquid crystal display device as Kubo et al. disclosed with (a) the opposite side of the light transmitting region to be **entirely** (to full exend) overlapping an adjacent gate line for increasing the capacitance of a storage capacitor in a liquid crystal display device to improve the image quality of an LCD device (col. 1 lines 25-26, 40-41 and 53-54); (b) the circular polarizer includes a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength λ=400nm-800nm (in range of 380-800nm) for replacing both ¼ wave plate and linear polarizer without absorbing photonic energy and producing heat (col. 3 lines 7-10) and high brightness (col. 4 lines 64-67) taught by Faris.

2. Claim 7-10 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo et al. (US6295109B1) in view of **Stupp et al. (US5929463A)**.

In regard to claim 7, Kubo et al. teach (Figs. 21-22) a transmission-reflection type liquid crystal display device comprising

- a plurality of gate lines 53 and data lines 59a defining a plurality of pixels;
- a transistor in each pixel,

- a gate (gate electrode 52) of which is connected to a gate line and
- a second terminal (source electrode 59b) of which is connected to a data line;
- a reflecting film 61 **as functioning as a pixel electrode** formed in each pixel and connected to a third terminal (drain electrode 59c of the transistor in each pixel, an outer edge at a side of said reflecting film overlapping one of said gate lines substantially, while an outer edge at an opposing side of said reflecting film does not overlap an inner edge of an adjacent gate line,

wherein

- a light-transmitting region (region T) through which light may pass is disposed between one of said gate lines and said outer edge of said reflecting film, which does not overlap an inner edge of said adjacent gate line.

Claim 8:

- light-transmitting region (region T) exists between a data line adjacent to the data line connected to the second terminal of the transistor and the reflecting film in each pixel.

Claim 9:

- the reflecting film overlaps (not entirely) the data line connected to the second terminal of the transistor in each pixel as Fig. 8A shown.

Claim 10:

- the reflecting film overlaps (not entirely) a gate line adjacent to the gate line connected to the gate of the transistor in each pixel as Fig. 8A.

Claim 29:

- the reflection electrode 61 made of aluminum considers as the pixel electrode.

However, Kobo et al. fail to disclose the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflecting film in each pixel, the opposite side **entirely overlapping** an adjacent gate line.

Stupp et al. teaches (Fig. 1) a liquid crystal display device with the light transmitting region disposed between an inner edge of a gate line (row electrode 12) and a side of outer edge periphery of the pixel electrode 10 in each pixel, the opposite side **entirely** (to full extend) overlapping an adjacent gate line 12 for providing the extra capacitor 29 in a liquid crystal display device to improve the a charge storage capacity; thereby, it is obvious to further modify the opposite side to be **entirely** (to full extend) overlapping an adjacent gate line for maximizing the extra capacitor to improve a charge storage capacity.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a transmission-reflection type liquid crystal display device as Kubo et al. disclosed with the opposite side of the light transmitting region to be **entirely** (to full extend) overlapping an adjacent gate line for the capacitance of a storage capacitor in a liquid crystal display device to improve the image quality of an LCD device by reducing flickering and other image defects as taught by **Stupp et al.**.

Conclusion

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (571) 272-2296. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HOAN C. NGUYEN
Examiner
Art Unit 2871

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ANDREW SCHECHTER
PRIMARY EXAMINER